Cell Stem Cell

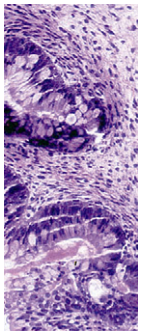
Editors' Notes

Her Place in World History, and in Our Own

The death of Dr. Anne McLaren was met with great sadness and a sense of loss in the stem cell community. We at CSC had the distinct pleasure of working with Anne to produce her Commentary for our inaugural issue. In fact, her article is cited in this issue by the ISSCR Committee Forum and the Eurostemcell Meeting report, both of which have been dedicated by the authors to Dr. McLaren's memory. We are also very happy to pay tribute to her many achievements with an obituary written by her colleagues Professors Roger Pedersen and Brian Salter.

It's All about Balance

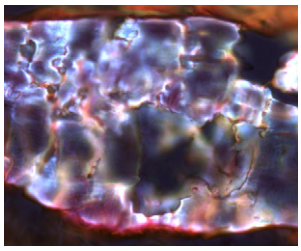
Striking a successful balance of division, differentiation, and death is important for all stem cells, and their predominant activity at any one time will vary, such as during development, in response to injury or to maintain homeostasis. Multiple papers in this issue speak to the pathways utilized over a range of physiological contexts and of the consequences when equilibrium is lost. Tothova and Gilliland have contributed a review of the roles played by FoxO family members in stem cell function and disease. Chien's lab demonstrates that the balance of Wnt signaling can tip the fate of cardiac progenitors during heart formation by promoting the expansion of primitive cells and preventing their differentiation. Generation of mature cells may also be inhibited by blocking the cycling of stem cells, as shown by Lipton and colleagues in a mouse model of HIV-associated dementia. Transgenic expression of gp120 led to the MAPK-dependent cell-cycle arrest of adult neural progenitor cells, leaving them unable to contribute to neurogenesis. This stem cell-centric view into the mechanism of a human viral pathology demonstrates why it is essential to uncover the range of mechanisms that control stem cell balance.



Chimeras: Shock Value or Basic Tools?

Chimeras, organisms harboring cells from distinct sources, have become an essential tool for many aspects of stem cell science. We present a trio of articles that discuss varied issues relating to the generation of human-animal chimeras. In this issue, the ISSCR Ethics Committee provides new guidelines for chimera research in the Society section. In articles appearing online, Richard Behringer reviews the range of systems in which human-animal chimeras have already been used, and in a Commentary article, George Daley and colleagues provide an historical view of the teratoma assay and a suggestion that this technique should be regulated by animal care committees, not ESCRO boards. Both of these articles will be included in our September issue. An important distinction is that these pieces do not cover the generation of hybrids, for example, by transfer of human nuclei to animal oocytes. This series underscores our intention to publish material that will generate discourse, and we invite you to respond via the Correspondence format.

Stem Cells at Work and at Home



The discovery of *Drosophila* gut stem cells with properties similar to those in the mammalian intestine led to considerable excitement about their utility for analysis of stem cell function. In this issue, Hou's lab now describes renal and nephric stem cells (RNSCs) in the fly Malpighian tubule, the functional equivalent of the kidney. The absence of an obvious cellular niche component, some evidence of tissue plasticity, and the relatively high frequency of the population all point to a powerful new system in which to study regulatory, and perhaps even epigenetic, control of stem cell function. The importance of studying stem cells in their correct context and the difficulties of doing so in vertebrate systems are highlighted by independent HSC studies from the Morrison and Eaves labs, also in this issue. Whether RNSCs display uniformity in their stem cell traits, and how broadly applicable such findings will be to mammalian tissues remain to be seen.

Much Ado about Something Important

An explosion of scientific and mainstream media coverage marked the coordinated release of three iPS reprogramming papers, including that from Hochedlinger's group in our inaugural issue. Given that iPS cells are solely murine, rely on immunogenic gene delivery systems, and are oncogenic in many cases, the media furor was called into question by some. However, the fact that three independent groups, including the original lab, were all able to repeat, extend, and improve on Takahashi and Yamanaka's pioneering work is significant news. Does the existence of murine iPS cells obviate the use of human blastocysts? Of course not. Many scientific and ethical issues remain and are not limited to the debates in political circles. International discussion and consultation are essential, as highlighted by Brüstle and colleagues' Meeting Report in this issue.